

Profile

Ph.D. candidate in Computer Science focusing on reinforcement learning, supervised learning, computer vision, and generative/LLM-based methods. I build modularized explainable, environment-aware AI systems that integrate perception, control, and optimization for real-world environments.

Education

New Jersey Institute of Technology

Ph.D. in Computer Science

Advisor: Shivvrat Arya (currently on trial); Jason T. L. Wang (previous)

2021 – 2027 (expected)

CGPA: 4.0

New Jersey Institute of Technology

M.S. in Computer Science

2020 – 2021

CGPA: 3.9

Technical Skills

Programming: Python (primary), C++ (strong), Java, Bash/Shell, SQL

ML Frameworks: PyTorch, TensorFlow, JAX, Scikit-learn, OpenCV, CUDA; Distributed Training (DDP)

ML Techniques: Transformers, LLMs, Deep RL (DQN/PPO), GNNs, Attention Models, Representation Learning; Generative Models (Diffusion, LoRA, NeRF/Gaussian Splatting); Uncertainty Modeling

Domains: Computer Vision, Generative Modeling, Traffic Simulation, Sequential Decision-Making, Probabilistic Modeling, Combinatorial Optimization

Tools: Linux, Git, Docker, Weights & Biases, TensorBoard, LaTeX

Research and Projects

VisionLight: RL for Video-Based Traffic Signal Control

2024 – 2025

- Built image-based traffic agent using surveillance camera video with a dynamic flow-aware attention module in CARLA.
- Implemented a scalable multi-GPU training pipeline for high-throughput learning.
- Achieved an average 56.8% improvement over state-of-the-art baselines across key traffic efficiency metrics.

Flow-Aware Uncertainty Modeling for Traffic Control

2024 – 2025

- Developed image-based entropic attention to estimate dynamic flow change uncertainty in traffic simulation.
- Improved policy performance by 46.2% and significantly stabilized training when integrated into VisionLight.

RNA Label Inference with Graph Neural Networks

2022

- Designed a GNN-based model to infer missing RNA sequence labels from structural graph relationships.
- Enhanced dataset consistency through graph-driven embedding propagation.

DQN Traffic Light Control with Structured Inputs

2022

- Developed a DQN-based traffic controller trained in SUMO using structured intersection features and real-world data.
- Achieved 78% performance improvement compared to a stationary fixed-duration traffic signal.

Intense Solar Flare Prediction using Transformers

2021

- Built a transformer model for intense flare prediction with a magnetogram abnormality-aware module.
- Achieved 61.9% accuracy and uncovered key single-polarity magnetic patterns associated with intense flares.

Other Projects: YOLO Aim-Assist System, XPBD cloth simulation, PBR renderer, evolutionary image reconstruction, Android messaging app.

Publication

Y. Abdullaah, J. Wang, P. Bose, **G. Zhang**, et al. (2022).

Forecasting the Disturbance Storm Time Index with Bayesian Deep Learning, FLAIRS Conference Proceedings.

Experience

Instructor & TA, NJIT

2021 – Present

Teach CS114 and supported CS415; lead lectures/recitations/office hours, designed assignments/exams.

Graphic Designer & Education Consultant, Zhongzhi Education

2017 – 2018

Created digital media content and provided academic and career planning support.

Game Designer, JoyMeng Ltd.

2016 – 2017

Designed gameplay systems, level content, and player interaction scenarios in Unity.